DOCUMENT RESUME

ED 035 364 HE 001 302

AUTHOR	Crawford, Bryce
TITLE	The Support of Interdisciplinary and Transdisciplinary Programs.
INSTITUTION	Council of Graduate Schools in the U.S., Washington, D.C.
PUB DATE	5 Dec 69
NOTE	9p.; Address to the Ninth Annual Meeting of the Council of Graduate Schools in the U.S., Washington, D. C., December 4-6, 1969
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.55
DESCRIPTORS	Administrative Organization, *Budgets, Curriculum Development, *Departments, *Graduate Study, *Higher Education, *Interdisciplinary Approach
IDENTIFIERS	*Minnesota University Graduate School

ABSTRACT

Graduate degree programs in the University of Minnesota Graduate School are set up without formal reference to departments. The graduate faculty having governance of a given major field generally includes scholars in more than one department. The idea of transdisciplinary programs is thus widely accepted. Problems arise, however, when it comes to financial support. The department is the budgetary unit and, there, questions of loyalty and departmental priorities sometimes take precedence. To create a special interdepartmental program with its own budget introduces the problem of what to do with the staff when the program expires. Because it is important to strengthen and promote graduate interdisciplinary programs, such efforts should not be restricted to such permanent entities as departments, though departments must be involved and should control permanent appointments. A transdepartmental referee, who has control of budgetary and position allotments, will be needed to iron out disagreements. Mechanisms, other than departmental, must be established for initiating new transdisciplinary graduate programs and making promotion recommendations. (AF)

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THE SUPPORT OF INTERDISCIPLINARY AND TRANSDISCIPLINARY PROGRAMS

BRYCE CRAWFORD, UNIV. of MINN.

Each of us must speak against the background of his own experience, and it is inevitable therefore that my approach to this interesting pragmatic topic derives from our peculiar folkways at the University of Minnesota; it is as well for me to acknowledge this at the start. My hope is that, if I frankly base my opinions on the Minnesota experience, the subsequent discussion will bring forth other approaches derived from other institutional experience, and we may all profit from comparisons and all take home new ideas for improvement.

Part of my background, then, is the Minnesota Graduate School organization in which graduate degree programs are set up without formal reference to departments even in the case of what I presume we should distinguish as intradisciplinary programs. The Graduate Faculty having governance of a given major field is appointed by the Graduate Dean, and quite normally includes scholars in more than one department. Thus the twenty-three full members of the Graduate Faculty in Microbiology include nine from the Microbiology Department in Minneapolis, four from the Microbiology Department in Rochester, three from Pediatrics, and one each from Dentistry, Surgery, Laboratory Medicine, Public Health, Food Science, Soil Science, and Chemical Engineering. To be sure, in such an intradisciplinary major field the department does provide a home base and an administrative locus; but our habit of thinking holistically of the University's graduate offerings helps us to maintain calm when considering transdisciplinary programs. We have, of course, the usual gamut of departments, institutes, and centers,

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but graduate programs traditionally disregard boundary lines both of departmental "bastions of medieval autonomy" (to recall Peter Elder's phrase) and of centers whose function is to provide a letterhead base for training grant applications. We use exactly the same channels and mechanisms in the consideration, review, approval, and program administration for graduate programs which involve several departments; so we have at least in the philosophical sense only normal troubles concerning the rationale for transdisciplinary programs. Obviously there are always questions regarding the justification for new graduate programs in what seems to be an emerging discipline, as Biochemistry and Statistics appeared each in its own time, and as Operations Research appears today; likewise in the case of proposed graduate programs which center not in a discipline but on a problem or field of application, such as American Studies or International Relations or Urban Planning -- the programs which Dean Alpert characterized as interdisciplinary -- there are questions of justification, propriety, and relation to the relevant disciplines. But such matters of basic justification or rationale are the purview of Dean Secrist's contribution, and I should not poach on his preserve.

What I am really leading up to is the assertion that, particularly in connection with matters of support for a program, the operative adjective for the trouble source is not interdisciplinary (nor poly- nor trans- nor multi-disciplinary) but rather inter-departmental. For, at Minnesota as elsewhere, the department is the practical budgetary unit through which a faculty member receives appointment, promotion, salary, and other goodies, and a student receives an assistantship. Certain loyalties are thus engendered; and also certain orders of priority develop regarding

departmental goals and the allocation of departmental resources. I believe that we benefit at Minnesota from our ingrained habit of thinking of graduate programs as not "belonging" to departments; but our University is made up of perfectly normal human beings, and there are inevitably and understandably differences in priorities which any department gives to its various enterprises, and those enterprises which are nearer the center of the department's focus rank higher than those which are more peripheral.

I might underscore my emphasis on the inter-departmental nature of our topic by citing our graduate program in Biochemistry, which I believe we would all nowadays define as uni-disciplinary, and which in my University involves the cooperation of two Biochemistry departments -- one in the Medical School and the other in the College of Biological Sciences -- plus of course a certain number of graduate faculty members in other departments. It is certainly inter-departmental in matters of financial support and institutional backing.

Christopher Morley once defined a familiar cooperative arrangement thus:

> "Marriage is the square of a + b;
> That is,
> $(a^2 + b^2 + 2ab)$;
> Where 2ab, of course,
> Is twins."

I think we too may define the 2ab, the added component or interaction term of our topic, rather specifically. There is a 2ab interaction term with regard to facilities, laboratory or library or field, which are either special or additional when we add to the department-centered programs a and b the inter-departmental aspect; but Dean Alpert has dealt with this point. I should like to direct my remarks to the other easily seen components of support and backing which must be present if a graduate program

is to flourish: adequate spiritual and financial support for both faculty members and students whose interest centers on an inter-departmental program.

I add the mention of financial support to that of spiritual support because both are required. There must be an atmosphere of support sufficient to recruit and retain and encourage faculty members with primary interest in the inter-departmental program. Money, of course, is not important; it is only essential. If an American Studies program relies on activity from members of both the History and the English departments, say (actually there will be other departments involved), then these colleagues must be paid. Should the historian primarily interested in American Studies -- slightly different in emphasis and perspective from his colleague interested in American history -- be paid from a separate "inter-departmental program" budget? That direction has many dangers, which to me seem to outweigh its easy advantages. Without spelling through them all, let me just say that such budgetary separation tends to build a wall between the inter-disciplinary scholar and his disciplinary colleague; and I think from Dean Alpert's remarks that he and I agree that our need today -- and I would say in all ages of scholarship -- is to strengthen the healthful interaction and community of interest between the "applied" scholar whose interest begins from a problem or application, and the "pure" scholar whose interest begins from the discipline. Moreover, if one sets up faculty appointments, with tenure and normal faculty status, in a separate "special inter-departmental program budget," then one is in difficulty if and when the experimental inter-departmental program expires. Departments, in short, and likewise faculty positions, should not be created lightly

or unadvisedly, but soberly, discreetly, advisedly, and in the fear -- if not of God -- then of the likelihood of change.

So we have the problem that, while the graduate faculty in Control Science feels that another electrical engineer of their ilk should be recruited and added to the E. E. department, that department, in its order of priorities, feels a greater need for a solid-state specialist. How do we resolve this tension?

Again in slightly different aspects, we encounter the same trouble. Certain teaching assistantships exist in mathematics; will they more likely be used to support a student majoring in Operations Research or in Mathematics pure and undefiled? When the calendar brings the academic equivalent of the Advent season, and the time for consideration of promotions is come, how can we ensure that the History Department properly weighs the contributions to the overall University enterprise of their colleague who hares off in the American Studies program? If a promising youngster shows interest in coming to Minnesota for graduate study in Biochemistry, should our two departments vie with each other, in the American spirit of free competition, to make him the better recruiting offer, each utilizing the available variety of fellowships, traineeships, and assistantships which, in the present uncoordinated welter of student-support programs, each separately controls?

Neither in my University nor to my knowledge elsewhere do we have all the answers. But I would venture on certain approximations. First, the mechanisms for support of graduate programs should permit of flexible exploration and adaptation to changing needs; this would imply that they should not be restrictively tied to such permanent entities as departments.

On the other hand, the departments embody a type of permanence and assurance properly associated with well-established disciplines of scholarship or categories of knowledge, which we should use as fulcrums for our cantilevers as we reach out to try new constructions. The corollary of these considerations is that existing departments must be involved in any new transdisciplinary programs; they cannot thrive without some measure of active interest and support from the established departments. This is hardly a startling conclusion: surely any worth-while interdisciplinary, or inter-departmental, program will elicit some voices of support from related departments -- but not necessarily voices of high-priority support.

A further corollary, to my mind, is that permanent appointments, carrying tenure, should involve the departments and be controlled by the departments: a man should have his appointment not in American Studies but in English, not in Fluid Mechanics but in Chemical Engineering, not in Operations Research but in Statistics; and he should achieve his promotions and tenure through the normal mechanisms of the department, which should evaluate appropriately his contribution to both departmental and inter-departmental enterprises.

My second point is suggested by these last sentences. If we are to call for departmental cooperation and participation in inter-departmental programs, then we must have a trans-departmental referee. There will be disagreements: there cannot be a baseball game without an umpire. The trans-departmental referee must be there, and he must have sanctions. Cooperation, even if voluntary and whole-hearted, needs a referee to settle differences of viewpoint. The two Biochemistry departments at Minnesota both have a clean and vital interest in the unitary graduate program in

Biochemistry: this enterprise is indeed of central importance to both departments and cooperation in this mutual interest is beautiful to observe. But though their disagreements are mild, it is useful that there is a referee; authorization of graduate programs is given and on occasion withdrawn by the Graduate Dean; there is therefore a real sanction more than adequate to back the very mild degree of referee's decisions in disagreements between these two departments whose real and central interests are so concurrent. In other cases cooperation is of less central interest and the sanction must be more persuasive: few children are persuaded to eat their supper by threatening to deprive them of spinach. The referee or system of referees must have control of essentials -- budgetary and position allotments; decisions on allocation of resources must be made by trans-departmental and often trans-collegiate administrators, and these should be made with the aid of evaluative recommendations from appropriate faculty committees. There are various specific ways in which this can be done, working through or if necessary around departmental budgets, tactfully but firmly, usually with the graduate dean and the arts college dean or the academic vice-president supplying between them both the velvet glove and the iron hand. This type of persuasive referee decision or influence can be effective with regard to a wide variety of inter-departmental actions, ranging from the recruiting of appropriate new faculty to the allocation of student support and on to the cooperative course offerings among several departments. It is a type of central administrative influence whose dangers, when exerted with too much arrogance or decanal self-confidence, need not be stressed. Yet I see no alternative to some such approach to counterbalance the influence of provincial

self-interest of departments. The referee is needed; but he must act in that spirit, or better in the spirit of a team captain, and not as a despot.

Thirdly, we cannot rely on the normal departmental mechanisms for the initiative needed in regard to inter-departmental programs. One aspect of course is the suggestion of such programs. There must be a provision for initiating consideration of transdisciplinary programs through channels other than departmental, simply because a transdisciplinary program may not command enough support in any single department to bring it out with a recommendation for consideration. One way to provide such a mechanism exists at Minnesota, where new graduate programs need not be proposed by any department, but may be brought forward for consideration by any group of graduate faculty members who feel they have identified an area of scholarship worth developing into a formal graduate program. There must certainly be other means to the same end.

Another sub-heading under the title of initiative has to do with promotion recommendations; there should be a decent and respectable route for the recommendation of a faculty member for promotion, other than by the department. This could be through an appropriate faculty group review of the progress of an inter-departmental program. Perhaps it might be well even to provide the possibility for a faculty member, feeling unappreciated, to propose himself for promotion -- with of course an appropriate and defined mechanism for evaluation of his self-recommendation by an inter-departmental committee. The important thing is that there exist a defined and normal and respected route for the initiation and evaluation of such matters aside from the departmental route.

Finally, and more generally and optimistically than my comments up to this point may appear, I believe that the questions regarding financial support and institutional backing of transdisciplinary programs remain in their larger aspects just the same as the questions of support and backing of academic programs in general. The special points I've touched on are small perturbations on the ever-present question of support and backing for progressive academic programs in general. Transdisciplinary programs are nothing new or modern; any living community of scholars will turn up and pursue transdisciplinary questions out of the very nature of scholarship. Given a chance to mingle, scholars will interact across fields; some to be sure will keep narrowly to their own kind, but there will be enough of the broadly curious and articulate to leaven the lump. So they find each other's fields fascinating, as with my biochemical colleague who is rather an expert in Civil War history, or my legal colleague whose knowledge of thermodynamics and classical physics is both profound and vivid. So the physicist and the economist find the mathematician a helpful colleague, and he in turn finds stimulation in their discussions; so the classical scholar finds common interest with the anthropologist and the geologist. It is in the nature of scholarship to require constantly changing patterns of categorization, to discover new patterns and alignments, shared problems and merging interests. No external stimulus nor outside imposition led to the trans-disciplinary program of molecular biology: the dissective progress of biology simply met the synthetic progress of structural chemistry to form a common frontier, when an enzyme was at once a molecule and an organism. Trans-disciplinary programs are not an exotic fungus, but the natural healthy growth; if they present problems beyond our general difficulties in academic management, it is not any abnormality in the programs, but our own adminis-trative arteriosclerosis which is to blame.